2) Transferencia Normalizada

$$|T(jw)|^2 = \frac{1}{1+\varepsilon^2 w^{2n}} \Rightarrow \underline{n=3} \Rightarrow |T(jw)|^2 = \frac{1}{1+\varepsilon^2 w^6}$$

$$|T(jw)|^2\Big]_{w=\frac{s}{j}} = \frac{1}{1+\varepsilon^2\left(\frac{s}{j}\right)^6} \Rightarrow |T(s)|^2 = \frac{1}{1-\varepsilon^2 s^6} = \frac{1/\varepsilon^2}{\frac{1}{\varepsilon^2}-s^6}$$ //

$$\left.\begin{aligned} T(s) &= \frac{c}{s^3+s^2 a+sb+c} \\ T(-s) &= \frac{c}{-s^3+s^2 a-sb+c} \end{aligned}\right\} |T(s)|^2 = T(s).T(-s)$$

$$\left.\begin{aligned} c &= \frac{1}{\varepsilon} \\ 0s^4 &= (-2b+a^2)s^4 \\ 0s^2 &= (2ac-b^2)s^2 \end{aligned}\right\}$$

$$\frac{2a}{\varepsilon}-b^2=0 \Rightarrow b=\sqrt{\frac{2a}{\varepsilon}} \Rightarrow b=\sqrt{\frac{2}{\varepsilon}}\cdot\sqrt[6]{\frac{8}{\varepsilon}} \Rightarrow b=2\sqrt[3]{\frac{1}{\varepsilon^2}}$$

$$-2\sqrt{\frac{2a}{\varepsilon}}+a^2=0 \Rightarrow \frac{a^2}{2}=\sqrt{\frac{2a}{\varepsilon}} \Rightarrow \frac{\varepsilon}{8}\cdot a^4-a=0$$

$$a.\left(\frac{\varepsilon}{8}.a^3-1\right)=0 \quad \nearrow a=0 \times$$

$$\searrow a=\sqrt[3]{\frac{8}{\varepsilon}} \Rightarrow a=2\sqrt[3]{\frac{1}{\varepsilon}}$$

$$a=2\sqrt[3]{\frac{1}{\varepsilon}}\ //\ ;\ b=2\sqrt[3]{\frac{1}{\varepsilon^2}}\ //\ ;\ c=\frac{1}{\varepsilon}\ //$$

$$T(s) = \frac{1/\xi}{s^3 + 2\sqrt[3]{\frac{1}{\xi}}\,s^2 + 2\sqrt[3]{\frac{1}{\xi^2}}\,s + \frac{1}{\xi}} \Rightarrow \xi = 0{,}5088$$

$$\boxed{T(s) = \frac{1{,}9654}{s^3 + 2{,}5052\,s^2 + 3{,}1381\,s + 1{,}9654}}$$